VIIRS Sea Surface Temperature (SST) EDR Release, Beta Data Quality
February 2013
Read‑me for Data Users

The JPSS Algorithm Engineering Review Board released the VIIRS Sea Surface Temperature (SST) Environmental Data Record (EDR) to the public with a Beta level Maturity as of 22 January, 2012. Beta quality is defined as:

- Early release product
- Initial calibration applied
- Minimally validated and may still contain significant errors (additional changes are expected)
- Available to allow users to gain familiarity with data formats and parameters
- Product is not appropriate as the basis for quantitative scientific publications, studies and applications

The Board recommends that users be informed of the following product information and characteristics when evaluating the VIIRS SST EDR.

1. The SST EDR currently reports two SSTs – bulk and skin. Bulk SST = Skin SST + 0.17K. Once new requirements are approved, the bulk SST will be dropped and its slot reused to record first-guess SST. For now, users are advised to concentrate their analyses on skin SST only.

2. SST at swath edges reveals strong "limb cooling", due to suboptimal SST equations coded in the IDPS system. Revisions to SST formulations are underway, which will improve SST performance in the full VIIRS swath.

3. Prior to August 10, 2012, the SST quality flags were not set correctly under certain anomalous conditions due to a bug in the code. This bug was fixed in Mx6.0, implemented into operations on August 9, 2012.

4. SST Quality Flags are suboptimal and are being revisited and redesigned, and will be redefined in the future versions of the SST EDR.

5. Quality of the SST EDR is critically sensitive to the stability, accuracy and precision of the VIIRS SDRs. Performance of the SDRs has been verified and found very good and acceptable after the last revision to the thermal SDRs' calibration on 7 March 2012.

6. Performance of VIIRS Cloud Mask (VCM) remained non-uniform and suboptimal during the full monitoring period from 22 January 2012-present. Similar suboptimal performance issues have been observed with the VIIRS Sea Ice Concentration (SIC) algorithm as well, affecting SST (e.g., regions of ice flagged as water in high latitude regions). Fixes to both VCM and SIC are currently underway and will be reflected in future versions of the SST EDR.

7. Although the SST EDR has been produced by IDPS, monitored by STAR's SST Quality Monitor (SQUAM; www.star.nesdis.noaa.gov/sod/sst/squam/HR/), and will be available from CLASS, since 22 January 2012, the quality is suboptimal and non-uniform. Initially, pre-launch simulated regression coefficients were used. These were later recalculated based on real match-ups with *in situ* data, but became obsolete on 7 March 2012, due to recalibration of VIIRS SDRs in thermal bands. They were again recalculated from match-ups and subsequently implemented into operations on 17 July 2012. Furthermore, black body warm-up/cool-down exercises in Feb 2012 resulted in large spikes in SST, up to 7K.

8. The next steps in the VIIRS SST EDR validation process, to move the product to Provisional maturity, include the following:
    a. Improve performance of VCM, especially during the daytime, and SIC;
    b. Redesign the SST EDR, including removal of the bulk SST layer and replacing with first guess SST;
    c. Change SST regression formulations; and
    d. Redefine SST Quality Flags (QFs) and reorganize SST QF code.

Additional information on VIIRS and algorithm theoretical basis documents (ATBDs) is available at: http://www.star.nesdis.noaa.gov/jpss/ATBD.php.

Web-based analysis of the VIIRS SST EDR product—along with other SST products—can be found at the SQUAM website www.star.nesdis.noaa.gov/sod/sst/squam/HR/

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